

Context Connections - a TIPS Math Trail

Take your math buddy to the photo spot and do some math! All you need is a pencil.



1) Knowing Facts and Procedures ...

The chandelier's shape is similar to a cone.
The volume of a cone is given by the formula:

$$V = \frac{\pi r^2 h}{3}$$

Determine the volume of a cone given:

$r = 40$ cm and

$h = 40$ cm.

Show your work.

2) Making Connections ...

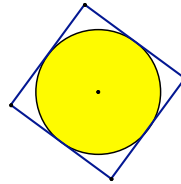
Derek's mother just reminded him for the umpteenth time to turn off the light in his bedroom. Does it really save a lot of money if you turn off the lights? Does it save a lot of energy? What information would you need to answer these questions?

Home Extension: Determine how much power and money are saved for different types of energy conservation in your home.

3) Communicating ...

If you stand underneath the chandelier and look up you will see a circle inside a square.

This diagram has a circle inside a square:



Which of the following estimates do you think is best for this diagram?

- a) 50% of the square is covered by the circle,
- b) 75% of the square is covered by the circle, or
- c) 90% of the square is covered by the circle?

Give reasons for your answer.

4) Reasoning and Proving ...

Suppose there is only one person in this room. What is the probability that the person is standing under a chandelier? *Give reasons for your answer.*

5) Literacy link ...

You have decided to buy a very large chandelier. The advertisement for your chandelier includes the following information:

Chain length: Chain length is not included in the cost for each chandelier. All chandeliers are shipped with 0.5 m of chain. Each additional metre is \$4.50 per metre. Very large models require heavier chain that is \$8.00 per metre.

Your chandelier needs a total of 3 metres of chain. How much more will you have to pay?

6) Make your own question:

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1) Knowing Facts and Procedures ...

Estimate the volume of one cushion on the couch.
Describe how you found your answer.

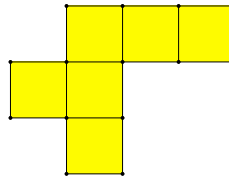
2) Making Connections ...

Estimate the volume of the whole couch.
Give reasons for your answer.

3) Communicating ...

The material on this couch has lots of squares in the pattern. A piece of this material could be cut to make a net for a rectangular prism.

François cut out the figure given below and he thinks it is a net for a rectangular prism. Is he correct? *Give reasons for your answer.*



4) Reasoning and Proving ...

Look at just one cushion on this couch. Notice all of the squares in the material. Imagine a penny on the square in the bottom left corner of the cushion. Now imagine 2 pennies in the next square, 4 pennies in the next square, 8 pennies in the next square, 16 pennies in the next square and so on. If you were able to put pennies on all of the little squares on one of the cushions then what could you buy with this collection of pennies?

- a) a new video game,
- b) a \$2000 savings bond,
- c) a house, or
- d) this hotel?

Give reasons for your answer.

5) Literacy link ...

A couch is a 3-dimensional object. When can we use the adjective "3-dimensional" to describe something?

6) Make your own question:

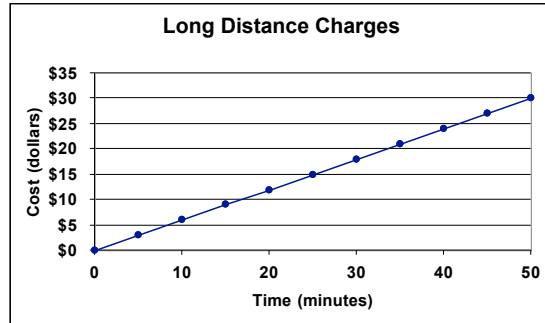
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1) Knowing Facts and Procedures ...

Use the graph to determine how much it would cost for a 12 minute long distance call. Describe how you determined your answer.



2) Making Connections ...

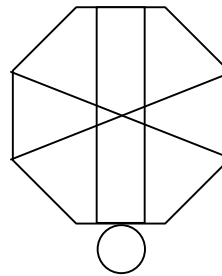
Look at the graph in question 1.
Suppose the long distance rate increased and a new graph was created.
Compare the old and new graphs.

Hint:

What would be the same?
What would be different?

3) Communicating ...

You are talking to your math buddy on one of these telephones. Your buddy can HEAR you but cannot SEE you. How would you describe this design so that your buddy could draw it? Use mathematical language whenever possible.



4) Reasoning and Proving ...

Area codes have three digits.
What's the area code for these telephones?
If you live in Sudbury the area code is 705.
There is a zero in the middle of this area code however area codes cannot begin with a zero.

What is the total number of possible three-digit area codes? Give reasons for your answer.

5) Literacy link ...

A telephone has 10 digits on the keypad.
What are the 10 digits?
What does this statement mean:
"Erika earns a 6-digit salary."

6) Make your own question:

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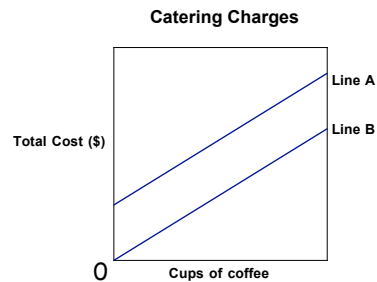
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1) Knowing Facts and Procedures ...

A caterer charges a base fee for serving coffee plus a fee for each cup of coffee. Which line in the graph would best represent catering charges that are calculated in this way?

Give reasons for your answer.



2) Making Connections ...

How many different ways could you order your coffee if you have these options:

→ 0, 1, or 2 creamers,

→ 0 or 1 sugars?

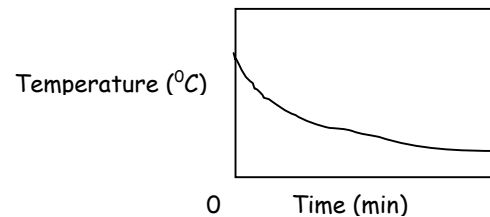
Give reasons for your answer.

3) Communicating ...

Sali takes a cup of coffee but she is busy talking and her coffee cools to room temperature. The graph shows the temperature of her coffee over a period of time.

Is the graph linear or non-linear?

Give reasons for your answer.



4) Reasoning and Proving ...

Caterers need to stack cups and saucers. A stack of saucers becomes very unsafe at a height of 25 cm. Use the following data to determine if a stack of 50 saucers is safe.

Number of Saucers	Height (cm)
5	3
7	4
9	5

Give reasons for your answer.

5) Literacy link ...

Converting a traditional coffee farm into a technified operation involves clear cutting the forest. A casualty of this conversion is biodiversity. Studies in Colombia and Mexico found 94%-97% fewer bird species in "sun grown" coffee plantations than in "shade grown" coffee because most of the birds are found in the canopy of the shade coffee plantations and very few forage in the coffee plants.

Source: http://www.koffeekorner.com/new_page_1.htm

If there are 100 bird species in a "sun grown" coffee plantation then how many bird species would you expect to find in a "shade grown" coffee plantation?

Give reasons for your answer.

6) Make your own question:

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1) Knowing Facts and Procedures ...

What shape is formed by the edge of the railing?

Estimate the total length of the railing. *Describe* how you found your answer.

2) Making Connections ...

Hot water tubs are often created in this shape. If the base of a hot water tub has an area of 4 m^2 and the depth of water in the tub is 0.5 m then what is the volume of water in the tub? *Give reasons for your answer.*

Why is it important to know how much water will be in the tub?

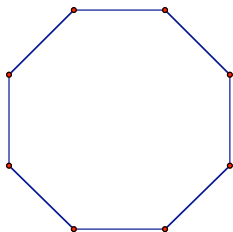
3) Communicating ...

There is a "hole" in the carpeting because of this structure. *Describe* how you would estimate the area of the missing piece of carpet.

4) Reasoning and Proving ...

The hotel management has decided that this open-topped area is unsafe. Wires will be fastened from each corner in the railing to every other non-adjacent corner. How many pieces of wire will be used? How many pieces of wire would be used if the structure had 30 sides instead of 8?

Give reasons for your answers.



5) Literacy link ...

The edge of the railing is a type of polygon. The prefix "poly" means many. List other words that begin with "poly".

Back in class ... we will play a game with your words so list as many as you can!

6) Make your own question:

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2) Making Connections ...	3) Communicating ...			
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